R E P O R T R E S U M E S

ED 018 265 PS 000 487

THE COGNITIVE ENVIRONMENTS OF URBAN PRE-SCHOOL CHILDREN. MANUAL OF INSTRUCTIONS FOR ADMINISTERING AND SCORING THE EIGHT-BLOCK SORTING TASK.

BY- MESS, ROBERT D. AND OTHERS
CHICAGO UNIV., ILL., URBAN CHILD CENTER

PUB DATE 67

EDRS PRICE MF-$0.25 HC-$0.44 9P.

DESCRIPTORS- *PRESCHOOL CHILDREN, *NEGRO MOTHERS, URBAN ENVIRONMENT, SOCIOECONOMIC BACKGROUND, COGNITIVE DEVELOPMENT, CLASSIFICATION, SORTING PROCEDURES, *PARENT CHILD RELATIONSHIP, TEACHING SKILLS, *INTERACTION PROCESS ANALYSIS, TASK ANALYSIS, *MEASUREMENT INSTRUMENTS, MEASUREMENT TECHNIQUES, TESTING PROGRAMS, CHICAGO,

THIS MANUAL DESCRIBES MEASURES USED IN "THE COGNITIVE ENVIRONMENTS OF URBAN PRE-SCHOOL CHILDREN" PROJECT AT THE UNIVERSITY OF CHICAGO. THE SAMPLE FOR THE STUDY CONSISTED OF 163 NEGRO MOTHER-CHILD PAIRS SELECTED FROM 3 SOCIOECONOMIC CLASSES BASED ON THE FATHER'S OCCUPATION AND THE PARENTS' EDUCATION. A FOURTH GROUP INCLUDED FATHER-ABSENT FAMILIES. THE MOTHERS WERE INTERVIEWED AT HOME AND THE MOTHERS AND CHILDREN WERE TESTED AT THE UNIVERSITY OF CHICAGO WHEN THE CHILDREN WERE 4 YEARS OLD. FOLLOW-UP DATA WERE OBTAINED WHEN THE CHILDREN WERE 6 AND AGAIN WHEN THEY WERE 7. THE BLOCK SORTING TASK WAS THE SECOND OF 3 MOTHER-CHILD INTERACTION TASKS GIVEN DURING THE SECOND UNIVERSITY TESTING SESSION. THE OTHER 2 ARE DESCRIBED IN PS 000 486 AND PS 000 489. EIGHT BLOCKS HAVING 4 DISTINGUISHABLE ATTRIBUTES--HEIGHT, SHAPE, COLOR, AND A MARK--WERE SORTED INTO 4 GROUPS USING PAIRS OF ATTRIBUTES. EACH MOTHER WAS SHOWN THE BASIS OF THE GROUPINGS SO THAT ADDITIONAL BLOCKS COULD BE CORRECTLY ADDED. SHE WAS THEN ASKED TO TEACH HER CHILD HOW TO ADD EXTRA BLOCKS TO THE GROUPS. HER INSTRUCTION WAS OBSERVED AS DESCRIBED IN PS 000 491 AND SCORED AS DESCRIBED IN PS 000 488. THE CHILD WAS TESTED WITH 2 NEW BLOCKS. SCORING WAS ON A 6-POINT SCALE, A POINT BEING GIVEN FOR EACH CORRECT PLACEMENT AND FOR EACH ATTRIBUTE MENTIONED AS A REASON FOR PLACEMENT. THE COMPLETE SET OF PROJECT MANUALS COMPRISES PS 000 475 THROUGH PS 000 492. (DR)

U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ED018265

THE COGNITIVE ENVIRONMENTS OF URBAN PRE-SCHOOL CHILDREN

Robert D. Hess, Principal Investigator

MANUAL OF INSTRUCTIONS

FOR ADMINISTERING AND SCORING

THE EIGHT-BLOCK SORTING TASK

The measures described in this manual were developed in the project, Cognitive Environments of Urban Pre-School Children, supported by: Research Grant #R-34 from the Children's Bureau, Social Security Administration, and the Early Education Research Center, National Laboratory in Early Education, Office of Education, both of the U.S. Department of Health, Education, and Welfare; the Division of Research, Project Head Start, U.S. Office of Economic Opportunity; the Ford Foundation Fund for the Advancement of Learning; and grants-in-aid from the Social Science Research Committee of the Division of Social Sciences, University of Chicago.

PS000

THE COGNITIVE ENVIRONMENTS OF URBAN PRE-SCHOOL CHILDREN

The research sample for the Cognitive Environment Study was composed of 163 pairs of Negro mothers and their four-year-old children, from three socioeconomic classes, defined by father's occupation and parents' education: upper-middle, professional and executive, with college education; upper-lower, skilled and blue collar, with high school education; lower-lower, semiskilled and unskilled, with no greater than tenth-grade education; a fourth group included father-absent families living on public assistance, otherwise identical to the lower-lower class group.

Subjects were interviewed in the home, and mothers and children were brought to the University of Chicago campus for testing, when the children were four years old. Follow-up data were obtained from both mother and child when the child was six years of age, and again at seven years.

Principal Investigator for the project is Professor Robert D. Hess, formerly Director, Urban Child Center, University of Chicago, now Lee Jacks Professor of Child Education, School of Education, Stanford University.

Co-Investigator for the follow-up study is Dr. Virginia C. Shipman, Research Associate (Associate Professor) and Lecturer, Committee on Human Development, and Director, Project Head Start Evaluation and Research Center, University of Chicago, who served as Project Director for the pre-school phase of the research.

Dr. Jere Edward Brophy, Research Associate (Assistant Professor), Committee on Human Development, University of Chicago, was Project Director for the follow-up study and participated as a member of the research staff of the pre-school study.

Dr. Roberta Meyer Bear, Research Associate (Assistant Professor), Committee on Human Development, University of Chicago, participated as a member of the research staff during the pre-school and follow-up phases of the project and was in charge of the manuscript preparation during the write-up phase of the research.

Other staff members who contributed substantively to the project include Dr. Ellis Olim (University of Massachusetts, Amherst), who was responsible for the major analysis of maternal language; Dr. David Jackson (Toronto, Ontario), who was involved in early stages of development of categories for the analysis of mother-child interaction, and participated in the processing and analysis of data; Mrs. Dorothy Runner, who supervised the training and work of the home interviewers, acted as a liason with public agencies, and had primary responsibility for obtaining the sample of subjects; and Mrs. Susan Beal, computer programmer.

COGNITIVE ENVIRONMENT STUDY

THE EIGHT-BLOCK SORTING TASK MANUAL*

SUMMER 1967

INTRODUCTION

The block sorting task was the project's major source of data for the measurement of the information-transmission aspects of maternal teaching. Cognitive sorting tasks are well-suited to this purpose because they impose a common goal upon all subjects (the sorting principle to be learned) but nevertheless allow for considerable variation in the means that may be employed to reach the goal. When the number of stimulus attributes (size, color, shape, etc.) and the number of gradations along each attribute are limited through experimental control, the thought processes (hypotheses) of the subjects may often be inferred from their manipulation of the stimuli. For this reason sorting tasks are used to study thought processes in experiments in which information is presented in a predetermined, constant manner for each subject. They are also useful for the study of communication, when the subject is asked to teach someone else and is allowed complete freedom of method and time.

The block sorting task described in this manual was administered as the second of the three mother-child teaching situations presented during the subjects' second visit to the university. It followed the toy sorting task which was less complicated and which allowed the subjects to become acclimated to the teaching situation. The block sorting task combines several features which made it desirable for our research:

1. It was unfamiliar to all subjects, so that none had had prior specific practice on it.

* We wish to acknowledge the contributions of Mrs. Mildred Levine, who assumed primary responsibility for the design of this task as a research instrument.

2. The difficulty level is such that sufficient interaction data can be obtained from both the most and the least adequate subjects.

3. It requires both verbal and non-verbal responses, and each response can be immediately recognized as either correct or incorrect.

4. The child could be tested, after the mother concluded her teaching, to obtain an objective measure of retention of the sorting principle and generalization to new stimuli.

MATERIALS

Fourteen blocks and a partitioned board were used in this task. The board was of brown slate, 12" by 12", divided into quarters by perpendicular white lines ( ). The board with its four sections served to emphasize the distinctiveness of the four groups of blocks.

The fourteen blocks were all standard Playskool blocks, appropriately painted, lacquered, and marked. They differed on four attributes.

HEIGHT: Tall blocks were 3½", short blocks were 1 3/4".

SHAPE: Cross-sections were either a 7/8" circle or a 7/8" by 1 3/4" rectangle.

COLOR: Blocks were painted red, yellow, blue, or green in Tempera Colors.

MARK: An X or an O was painted in white on each end of the block, about 3/8" high.

The fourteen blocks included 8 "original" blocks which formed the basic groups, 4 "extra" blocks which were to be placed into these groups, and 2 "test" blocks used only to test the child. The 4 "extra" blocks had a short pencil line on each end (in addition to the X or O mark) to facilitate identification. After the blocks were painted and marked they were lacquered for protection. The blocks used were the following:

	HEIGHT	MARK	CROSS-SECTION SHAPE	COLOR
"Original" Blocks:				
1.	Tall	X	Round	Red
2.	Tall	X	Round	Blue
3.	Tall	0	Rectangular	Yellow
4.	Tall	0	Rectangular	Green
5.	Short	X	Round	Green
6.	Short	X	Rectangular	Red
7.	Short	0	Round	Yellow
8.	Short	0	Rectangular	Blue
"Extra" Blocks:				
1.	Tall	X	Rectangular	Green
2.	Tall	0	Round	Red
3.	Short	X	Round	Blue
4.	Short	0	Rectangular	Yellow
"Test" Blocks:				
1.	Tall	X	Rectangular	Yellow
2.	Short	0	Rectangular	Red

PROCEDURE

Instructions to the Mothers

The mothers were taught the task while the children were not present. A non-directive approach was developed to avoid suggesting that particular methods or terminology were either expected or preferred. Once the mother grasped the essentials, teaching was continued to an overlearning criterion of 3 consecutive errorless trials, each involving both placement of blocks and verbalization of the sorting principle. This was done to reduce the possibility that mothers would become confused later when teaching the children, and to help equate for initial differences in learning ability. The mother was initially shown the eight blocks, in four groups by height and mark; she was told:

> HERE ARE EIGHT BLOCKS THAT HAVE BEEN PUT INTO DIFFERENT GROUPS. THERE IS A REASON FOR THE BLOCKS BEING GROUPED IN THIS WAY, BUT BEFORE WE TRY TO FIND OUT WHAT THAT REASON IS, I AM GOING TO SHOW YOU TWO OTHER WAYS IN WHICH THESE BLOCKS CAN BE GROUPED ON THE BOARD.

(Tester forms a group of tall blocks and a group of short

blocks.) HERE THE BLOCKS HAVE BEEN PUT INTO TWO GROUPS. HOW ARE ALL THE BLOCKS IN THIS GROUP ALIKE? (Tester points to short group placing palm over level tops of blocks until correct response is given, then moves to tall group.) ALL RIGHT, AND HOW ARE ALL THE BLOCKS IN THIS GROUP ALIKE?

(Tester places the four extra blocks near the mother.) CAN YOU PLACE THESE BLOCKS IN THE GROUPS WHERE THEY BELONG? ... YOU PUT THESE TOGETHER BECAUSE THEY'RE ALL ...? (Elicits answer for both groups.)

(Tester now forms a group of blocks marked X and a group marked O.) HERE THE BLOCKS HAVE BEEN PUT INTO TWO OTHER GROUPS. HOW ARE ALL THE BLOCKS IN THIS GROUP ALIKE? (Points to X group until correct response is given.) ALL RIGHT, AND HOW ARE ALL THE BLOCKS IN THIS GROUP ALIKE? (Elicits correct answer for O group.)

(Tester now forms four original groups using height and mark.)

NOW WE'RE BACK TO THE GROUPS WE STARTED WITH. HOW ARE THE BLOCKS IN THIS (short, X) GROUP ALIKE? (Elicits correct answer for each group, then gives extra blocks.) CAN YOU PLACE THESE BLOCKS IN THE GROUPS WHERE THEY BELONG? (If subject makes a mistake, tester says, THERE IS SOMETHING WRONG WITH THIS GROUP. This continues until all groups are correct.) YOU PUT THESE TOGETHER (short, X) BECAUSE THEY'RE ALL ...? (Elicits both criteria and then continues to other groups.)

(Removes extra blocks): YOU NOTICE THAT THESE EXTRA BLOCKS HAVE PENCIL MARKS ON THEM, SO YOU CAN TELL THEM FROM THE OTHERS.

NOW IF I WERE TO TAKE THE EIGHT BLOCKS OFF THE BOARD AND MIX THEM UP, COULD YOU GET THE BLOCKS THAT BELONG TOGETHER BACK ON THE BOARD? IT DOESN'T MATTER WHAT SQUARE YOU PUT THEM IN, SO LONG AS THE BLOCKS THAT BELONG TOGETHER ARE TOGETHER. (Tester removes and mixes blocks. If subject makes mistake, tester says, THERE'S SOMETHING WRONG WITH THIS GROUP. This continues until subject has all groups correct.) THAT'S RIGHT. I JUST WANTED TO BE SURE THAT IF THE BLOCKS GET MIXED UP LATER WHEN YOU'RE TEACHING (child) THAT YOU CAN GET THEM BACK INTO THE RIGHT GROUPS ... EVERYTHING I'VE SHOWN YOU SO FAR WAS TOHHELP YOU TO GET THE IDEA OF HOW THE BLOCKS ARE PUT INTO THESE FOUR GROUPS. NOW, WHAT I WANT YOU TO TEACH (child) IS HOW TO PLACE THESE EXTRA BLOCKS INTO THE RIGHT GROUPS ON THE BOARD. WILL YOU PUT THESE EXTRA BLOCKS AGAIN WHERE THEY BELONG? (If subject errs, tester says, THERE'S SOMETHING WRONG WITH THIS GROUP. This continues until all groups are correct. Tester then points to each group in turn, asking, YOU PUT THESE TOGETHER BECAUSE THEY'RE ALL ...? For each group she elicits both cri-

teria from the mother.) NOW THAT IS WHAT I WANT YOU TO TEACH (child). TEACH HIM HOW TO PUT THE EXTRA BLOCKS INTO THESE GROUPS (pointing to each group), AND TEACH HIM WHY THE BLOCKS IN EACH GROUP BELONG TOGETHER. YOU DON'T HAVE TO TEACH (child) HOW TO START WITH THE EMPTY BOARD UNLESS YOU WANT TO. HE ONLY HAS TO LEARN HOW TO PLACE EXTRA BLOCKS IN THE RIGHT GROUPS, AND WHY THE BLOCKS IN EACH GROUP GO TOGETHER. (Tester removes the extra blocks from the board.)

YOU CAN TEACH HIM IN ANY WAY YOU LIKE. I'LL BE OUT IN THE HALL WHILE YOU TEACH HIM. WHEN HE UNDERSTANDS HOW TO PUT THE BLOCKS INTO THESE GROUPS, AND WHY THE BLOCKS IN EACH GROUP BELONG TOGETHER, CALL ME BACK INTO THE ROOM. WHEN I COME BACK INTO THE ROOM I'LL GIVE HIM TWO DIFFERENT BLOCKS TO PLACE IN THESE GROUPS, AND I'LL ASK HIM TO TELL ME WHY HE PUT THEM WHERE HE DID. HE'LL HAVE TO DO THIS WITHOUT ANY HELP FROM ME OR FROM YOU. TAKE AS MUCH TIME AS YOU NEED TO TEACH HIM, AND YOU MAY TEACH HIM IN ANY WAY YOU LIKE. BE SURE TO CALL ME BACK IN THE ROOM WHEN YOU ARE FINISHED. (Tester leaves eight blocks correctly sorted into four groups on the board, with the four extra blocks to one side.)

Teaching and Testing the Child

At this point the child was brought in and the tester left the room, remaining outside until summoned by the mother. When called back into the room the tester removed the four extra blocks, made sure the four groups were present, and then presented two test blocks which neither subject had seen. The child was asked to place each block in the group where it belonged and was questioned about his reasons for placing them where he did. During this time the mother could support or encourage her child, but she was not allowed to give substantive help.

SCORING

The child's performance on the post-task test was later scored, with points awarded on the following basis:

Criterion	Score
1. Placement of short O test block in correct group	0 or 1
2. Verbalization of same height or short in explaining placement	0 or 1
3. Verbalization of same mark, O, or other descriptive tag used by mother when teaching (e.g., "cheerios"), in explaining placement	0 or 1
4. Placement of tall X test block in correct group	0 or 1
5. Verbalization of same height or tall in explaining placement	0 or 1
6. Verbalization of same mark, X, or other descriptive tag used by mother when teaching (e.g., "airplanes"), in explaining placement	0 or 1

In combination these scores yield a range of 0 - 6 points, and subscores (1st vs. 2nd block, placement vs. verbalization) may also be obtained. Points for verbalization were awarded only if the child had placed the block correctly on the attribute in question (height or mark); i.e., verbal labels had to be correct to be counted.

During the test the tester presented each test block, saying, WHERE DOES THIS BLOCK GO? After placement she asked, WHY DOES IT GO THERE? If the child's placement and/or explanation was correct but incomplete, the tester would move the block to all other groups, asking, COULD IT GO HERE? WHY? After this she would ask, WHERE IS THE BEST PLACE FOR IT TO GO? WHY?

The child was credited one point for each criterion he passed without help. Additions or corrections made in response to probing were credited. In general responses during probing were allowed to raise the child's score but not to lower it, since probing may have induced confusion or inhibition in some children. Any synonyms for "height", "tall", "short", "X", "O", or "mark" were accepted in scoring verbalizations. Ambiguous responses which did not include

a substantive label ("They look the same") were not credited for verbalization.

NOTE: The mother-child interaction during the teaching session (while the tester was out of the room) was recorded and observed, as described in MANUAL OF RECORDING AND OBSERVATION TECHNIQUES FOR MOTHER-CHILD INTERACTION.